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AN APPROACH TO THE MIND-BODY PROBLEM.[1]

THERE is no problem more crucial for science and philosophy than the mind-body problem. Here the physical world and mind somehow come together. Separate them as much as we will in our abstract thoughts, they refuse to remain separated in reality.

The way in which the mind-body problem has been envisaged, both as regards the terms and their relation, has corresponded to ideas of a very general nature. It has reflected assumptions which for various reasons—to be understood only historically—have dominated the thought of the day. Thus the peculiar feature of the mind-body problem is its lack of *specificity*. It is impossible to conceive of a single experiment whose results could decide the question. In this sense, it is a philosophical problem. But this statement needs explanation. It is a philosophical problem because it can not come within the sole purview of any one science. What is required is a coördinating hypothesis which will bring harmony into a complex field in which both the physical and the mental sciences are present. A point of view must be achieved from which the data and theories of the basic sciences can be ordered in relation to each other. It is obvious that such a point of view is impossible without the analysis of fundamental concepts. I have said analysis, but even more is involved. There must be a constructive development of these concepts, or categories, as well. Philosophy must achieve something positive in epistemology and *Kategorienlehre* if it hopes to aid the synthesis which confronts science.

Such is, if I mistake not, the logical position of the mind-body problem and the reason why philosophers must hold it to be peculiarly their own. But if philosophy is to be a coördinating science resting upon, and coöperative with, the special sciences, its envisagement of the problem must reflect the march of events within these sciences. It can not isolate itself and trust solely to the powers of dialectic speculation. Its hypotheses must result from the pressure of the general scientific movement and the fertile suggestion which such pressure gives to the creative imagination. It is in accordance with this conception of the function and motivation of philosophy that I have for some years concentrated upon the mind-body problem; and the general solution I offer claims to satisfy the logical requirements of a good hypothesis, agreement with the known facts and harmony with critically evaluated principles.

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[1] Read before the meeting of the American Philosophical Association at Princeton University, December 28, 1917.

Until recently, dualistic theories have been in the ascendent. Whatever form this dualism took, whether parallelistic or interactionistic, it rested upon certain traditional assumptions and inhibitions which have only lately been undermined by the growth of science and the corresponding increase of what may be called a realistic naturalism. While dominating different fields in the main, these assumptions with their positive and negative aspects reënforced one another in a curious fashion at the locus of the mind-body problem. The first set of assumptions turned around the acceptance of a dead-level, unevolutionary view of the physical world. It was held, for example, that the organism is nothing but the parts, or elements, into which it can be analyzed or disintegrated. Science committed something analogous to the fallacy of composition. Justice was not done to totality and organization. This set of assumptions can be connected with the prestige of mechanics and physics in the past. I had better say with the prestige of the *old physics*, for it seems to me that physics is seeing a new light as it begins to analyze the atom. This disintegrative naturalism of *nothing but* is what most people mean by materialism. I am suggesting not vitalism but a deepening of the physico-chemical view of the organic level to admit what some have called creative synthesis and others, critical moments. The second assumption which had to be outgrown may be called dualistic animism. The traditional antithesis between mind and matter, soul and body, had at least an inhibiting influence upon human thought. It is easy to see how materialism of the dead-level sort played into the hands of this assumption. The third assumption found its classic expression in Cartesian dualism, and is the philosophical expression of the first two assumptions. I do not think that it is too much to assert when I say that these interlocking assumptions account in large measure for the ineptitude of the traditional discussions of the mind-body relation. But one of the signs of the times is the bursting of the strait-jacket within which reflection has so long been confined.

So much in the way of an orienting introduction. I wish now to wipe the slate clean of these old assumptions and to approach the mind-body problem with fresh eyes. My thesis is, that the living organism, *when properly and adequately conceived*, includes consciousness and is the sole source of that differential behavior which distinguishes it from the behavior of less integrated bodies. Or, to put the argument in another way, I shall maintain that the mind-body problem resulted from false conceptions of both mind and body. I think that it is a good methodological principle that we should not assert a dualism unless there is no escape from it. In the main, modern reflection sinned against this principle because it started with two supposedly given realities, mind and body, whereas it needed to start with only one of these, for only one of them, the organism, is in the strict sense substantial.[1]

My queries will, then, be as follows: Is not the organism the subject of reference of all the knowledge about it gained by the various observational and experimental sciences, including behaviorism? Do not the contributions of these sciences supplement each other? And is there anything in this tested knowledge about the organism which forces us to exclude consciousness from the organism? Again, if the organism is the subject of reference of all this knowledge, what meaning must we assign to mind? If we can answer these questions in accordance with the drift indicated, the traditional mind-body problem disappears, to be replaced by such empirical questions as the genesis of types of behavior and the rôle of consciousness in the organism.

When the behavior of animals is carefully studied, certain characteristics stand out clearly. Reflex action is distinguishable from instinctive action, and this latter is seen to pass insensibly into intelligent action. When this method of approach is adopted we find that we can abstract from the older uses of the word 'mind' and simply note the empirical meaning which has grown up within the bio-psychological setting. We may need to deepen this meaning but we shall not be forced to reject it as a point of departure. It is customary, then, to speak of intelligent behavior and regard mind as a term for the *capacities and internal processes* of the organism which find expression in selection, progressive adaptation and learning by experience. Where we have these capacities, we have mind. The recognition of this situation is often expressed by saying that we know what mind does or how mind functions, but that we do not know mind itself. But this form of statement implies that mind is a substantive thing, coördinate with the organism, which behaves in a describable way. But is it not truer to the facts, and simpler, to say that in instances of intelligent behavior we know how the organism behaves? Is there anything in the facts which demands this assumption of two substantive things?[1] Knowledge of what mind does is really knowledge about the organism. We must be on our guard against the traditional dualism which is engrained in language. As I understand behaviorism on its positive side—in what it affirms rather than in what it denies—it recognizes the factual character of that ordered action which we usually call intelligent, and connects it with the functioning of the nervous system. If we continue to use mind as an objective category, that is, as a category of the physical sciences, we should mean by it the nervous processes which find expression in mental, or intelligent, action. The mind is the brain as known, not so much by nervous anatomy, as by objective psychology. It is the brain as known in its integrative capacities as shown in critically examined behavior. All of these sciences give knowledge about the brain, but they do not give the same kind of knowledge. The term mind is a recognition of this fact and, at the same time, a denial that there is need for any other object of knowledge than the organism. Obviously, there is no mind-body problem thus far.

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[1] By substantial I mean the relatively permanent subject of reference of our knowledge. All my knowledge of another person attaches itself to his organism as a locus of reference.

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[1] That is, two subjects of reference for our knowledge.

But while there is no mind-body problem in the traditional sense when this method of approach is adopted, the problem of the nature and origin of this apparently non-mechanical behavior becomes all the more acute because it becomes specific and tangible. As long as the abstract, mechanical ideal of explanation, an explanation by reduction, ruled thought, the postulate was maintained that this intelligent type of behavior could be reduced to a complex series of purely atomic, or unintegrated, motions. A physical system was supposed to be nothing but the sum of its parts and their immediate relations. But to-day this postulate has been weakened by the growth of the biological sciences. It is, to say the least, just as possible that a system is more than an external sum of parts, that it is an organization in which the whole exerts a control over the action of its parts, that the resultant action is a function of the system. The facts are pushing this latter view to the front. But, if accepted, it leads to the admission of *levels of causality* expressive of the creative synthesis which occurs in nature. In other words, the behavior of organisms forces the scientist to construct categories corresponding to the new range of facts, categories continuous with the old and not conflicting with them, and yet obviously striking a new note. Thus such terms as 'learning by experience,' adjustment, coördination, planning, etc., give the content of the term mental. The behavior of the organism is of the mental, or intelligent, type. The processes and capacities controlling and expressing themselves in this behavior are the mind of the organism; and these are obviously *in the organism as a part of its nature*. In all this, there need not be the shadow of a dualism because there is only one subject of reference of our knowledge. The behavior of the organism is a function of the organism in its changing relation to its environment. This behavior is of the mental or intelligent type, and its natural explanation must lie in the nature of the organism upon which, accordingly, it throws light.

Correct as we believe this approach to be, it does not exhaust the motives which still make the mind-body problem a real one.

Mind has been an ambiguous term somehow felt to cover internal capacities and consciousness; and, as long as consciousness was thought of as alien to the body, mental capacities tended to be loosened from the body in sympathy with it. Not until consciousness is seen to be immanent in the organism will the mind-body problem vanish in that more adequate conception of the living organism which we have predicted.

What, then, is the relation of consciousness to the organism? And how can we insert it into these capacities and processes of the organism which control intelligent behavior? These questions can not be answered apart from a satisfactory epistemology. The epistemology which I shall use has been justified elsewhere, and, in any case, space forbids me to do anything else now but explicitly assume it.[1]

Consciousness is the changing field of the individual's experience. It is the flow of complex content shot through with distinctions and meanings. This given contentual complex is consciousness, and consciousness is nothing other than what is given. Epistemological reflection discovers that knowledge exists only here, as do the experiences upon which knowledge is built. The point to bear in mind is that consciousness is not more than its content, and is obviously non-substantial. It is not a stuff but a flux. For this reason, I have been accustomed to call it a variant.

Now in this consciousness, the reflective self (subject-self) finds the distinction between the physical world and consciousness. Critical development of this distinction in the light of the facts leads the thinker to conclude that he can build up knowledge about the physical world, that is, that he achieves understood propositions which are referred to the physical world as knowledge about it. The character of this knowledge is an empirical affair, obviously; and it apparently falls into such general categories as position, measurements (size, weight, mass, energy), structure, properties, behavior. Such classes of knowledge about the physical world imply no apprehension of the world. This actual knowledge does, however, imply conditions of commerce with the world, conditions which seem to me to be fulfilled by the immersion of consciousness in an organism itself immersed in the world. The principles to bear in mind, then, are three in number: (1) that consciousness alone is given; (2) that knowledge of the physical world is neither an apprehension nor a reproduction of it but knowledge about it—a wholly human and empirical affair; and (3) that consciousness seems to be immersed in the organism just as the organism is immersed in, and a part of, the physical realm.

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[1] See my *Critical Realism* and *The Essentials of Philosophy.*

With these principles admitted, the evident next step is to ask whether there is any good reason to exclude consciousness from the organism. Does consciousness conflict with the organism as known? If we have really wiped the slate clean of the traditional dualisms and begun with fresh eyes, I feel certain that not a single reason can be advanced. I have canvassed all the suggested ones I could discover, and have come to the conclusion that consciousness is literally *in* the brain.[1] Yet, because consciousness is not a physical thing but a variant, this presence in the brain is unique and not comparable to the relations between physical things. We shall see that the lack of recognition of this fact has occasioned the unsuitable way in which the question of the efficacy of consciousness has been broached.

We have knowledge about the brain but no apprehension of the stuff of the brain. Consciousness is the only element of nature which is literally given and with which we have a revelatory acquaintance. It follows that the *setting* of consciousness in the brain can not be given. In other words, we are precluded from witnessing the ontological linkage of consciousness with its setting in the brain. Picture-thinking will not help us and is apt to lead us astray into patent absurdities. The situation is necessarily unique. The individual's consciousness is the only reality literally given. But he is convinced that this consciousness is in the brain about which he has only the knowledge which we described above. We must conclude that consciousness is continuous with its setting, but that we can only have knowledge about the whole functional system in which consciousness is. This fact should not disconcert the philosopher who is well aware that none of the real linkages in the physical world is open to inspection.

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[1] The double-aspect view is also an essential recognition of this conclusion. My epistemology obviates certain logical objections to the customary form.

But if the way of intuition is shut off, we must resort to knowledge to gain some notion of the function of consciousness. And it is at this point that I am inclined to diverge from what may be regarded thus far as an interpretation of the double-aspect view in the light of critical realism. I am persuaded that consciousness can be held to be efficacious.[1] What I am going to say from now on is more speculative and hazardous than the points I have so far made. The principle upon which I shall build is: *The efficacy of consciousness must be relative to its function.* This suggestive principle has been sadly neglected in the past. How long I have pondered over the query, assigned in James's *Principles of Psychology* to Mercier, how an idea of beefsteak can bind together two molecules! Everyone will remember Clifford's similar jibe. Now when the question of the efficacy of consciousness has been raised, psychologists have tended to assume that one could only mean mechanical efficacy of an interactionistic, or dualistic, type. I am going to suggest something quite different from this. It is really a plunge into *real*, as distinguished from *phenomenal*, causality. And one must further bear in mind that for me consciousness is a variant identical with its content and having no mysterious depths.

What is the probable function of consciousness? To answer this question we might either study processes of learning of a motor type or reflect upon cases of action after deliberation. In the first type of case, it seems clear that some sort of ordered fusion is facilitated by consciousness. It plays about growing points of integration. In action after deliberation, we have a conscious process of creative selection in which perceptual and conceptual situations are studied in the light of some purpose. Our conscious decision appears to be the internal stimulus of action. Our natural belief is that this process counts for something, that, without it, intelligent behavior would be impossible. And I think that this belief is correct. But how shall we conceive the process in the brain? Here is my suggestion: The cerebral processes involved in choice, and in fact in any complex process of integration, are processes of internal adjustment within a system in the making. In such systems consciousness is a natural ingredient whose function is to aid in the bringing together of the parts into a new integration by the cues it affords. Literally, it assists the brain to solve problems. Its function involves indeterminate integration.[1] Of this process of integration, the only part open to inspection is, of course, consciousness itself. It is as though another guided himself by what we saw.

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[1] For a typical denial of this further step see "The Mechanics of Intelligence," by Howard C. Warren, THE PHILOSOPHICAL REVIEW, XXVI, 6.

I shall allow myself certain comments at this point. Chosen, planned action involves a changing system of enormous complexity. It is to me impossible to conceive how the end-term could be reached were the process blind. Once more, consciousness, as a continuum, corresponds to the organic continuity of the system which is changing. As we pointed out earlier in the paper, a system is not an external sum of parts, its unity is more than the result of a process of addition. Now it is just to the aspect of changing unity that consciousness corresponds. It does not link molecules, for that is the old mechanical notion. It is not a physical thing; that is, it is not the whole of a physical thing, it is not a substance. It is a variant correlated with the shifting unity of a dynamic system. It is, as it were, the eye of that system. All this can be conceived without a dualism when we remember that the setting of consciousness can not be apprehended. It is the tendency to picture the setting in terms of naïve realism and then to oppose it to consciousness that leads to dualism.

One striking conclusion follows from this way of approach. The function of consciousness and, therefore, its efficacy, concerns the temporal dimension of reality. In less technical language, it is to be associated with change in the cerebral system. Here, and here alone, are we present to some part of the process of *real*, in contrast to *phenomenal*, causality. Consciousness is inseparable from a reality that changes, a view which fits in with the empirical nature of consciousness itself, which is usually described as a stream or flux. Thus the knowledge of the nervous system that we have fits in with the conception of consciousness as assisting in those new integrations which the exigencies of the situation of the organism are constantly demanding. Such critical integrations must be intelligent if they are to meet the requirements of the organism. But we can not understand their intelligence unless intelligence is actually at work within them as a part of their nature. The theory of knowledge I have advanced makes this immanence conceivable. But it is obvious that such a view requires us to relinquish a dead-level idea of efficient causality and to affirm grades of causality corresponding to the complexity of organization of systems and their qualitative delicacy of internal adjustment. Such an implication is less revolutionary than it may at first glance seem; for it harmonizes with the increasing admission of creative synthesis in nature. But, surely, creative synthesis suggests new properties and these involve new kinds of internal operation. What I can say here is necessarily sketchy, yet I hope that it gives a clue to my way of approach to the consciousness-brain problem.

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[1] Indeterminate integration means the actual self-determination of a system undergoing change. The result is not fixed independently of the system and the crisis is a genuine problem whose solution is not given in advance.

The two conclusions which stand out thus far are: (1) the immanence of consciousness; and (2) its function as guiding and assisting integration. Cerebral integrations can not arise through a mere blind pull and haul. Non-mechanical behavior can not be the expression of mechanical methods. We must take evolution seriously.

Let me next point out how this way of approach enables us to evade the customary problems confronting all forms of dualism such as, How can consciousness act upon the motor tracts of the brain? Consciousness has been assumed to be a reality external to the cerebral motor patterns and somehow selecting the proper one and touching the key that will send it off. Thus, even M. Bergson postulates an inbreak of psychical energy upon the brain. But, surely, the empirical objection to this is, that we ought to be aware of psychical energy; yet we are aware of only mental content. How does our own immanence-view enable us to avoid this traditional *impasse?* Simply enough. I would take the sensori-motor process as a unit and hold that the cortical process of which consciousness is a variant is always continuous with a motor pattern of the brain. In other words, cortical integrations arise in the same system as motor tracts. This means that ideas are from birth immersed in neural processes which have motor extensions. In brief, ideas and motor tendencies are always on the same circuit. A dominant idea means a dominant cortical system, and such a system has its genetically developed motor roots. It is for this reason that a dominant idea which is not inhibited passes into action. A dominant idea is a sign of a completed integration which settles into action. Hence, in the brain itself, idea and action are only stages in a continuous neural process; but because only the idea is given to us we are prone to erect a discontinuity and to ask how the idea by itself—which we forget is an abstraction from its ontological setting—can *produce* what follows. There is no bare thought acting from outside and mechanically upon motor patterns. The efficacy of consciousness is one of guidance *within* a system rather than one of dynamic action *upon* a system.

We are forced to conclude that the relation of consciousness to the brain is internal and unique. It is a relation which can be understood in some measure only when a correct knowledge about the brain's method of action is added to a proper conception of consciousness. Only then can we achieve a penetrative notion of the function of consciousness within the shifting action of the cortex. Only then can we realize how intelligence can be at the helm and account for intelligent action in response to the demands that new situations bring. M. Bergson is correct in his premise that none of the familiar stock of relations is equal to the subtlety of this relation. But his epistemology and his conception of the brain are quite different from ours. For him, the brain is simply a system of motor patterns; for us, the brain is an ideo-motor system.

We are at last in a position to suggest that constructive union of behaviorism and introspective psychology—I use this latter term without definition for the broader current of psychology—which is a desideratum of to-day.

We saw that mind, as a category of natural science, stood for empirically witnessed, intelligent behavior and the capacities and internal processes of the organism which expressed themselves after this fashion. The sole subject of reference is the organism. I know others primarily only in terms of what they do; or, to put it more broadly, I know them *through* what they do, this doing including the use of language. It is for this reason that behaviorism rejects consciousness as long as possible and satisfies itself with a study of the laws of those internal processes which control conduct, these laws being determined in entire agreement with the principles of natural science. Thus behaviorism busies itself with an 'objective' study of mind. This means that the assumptions and methods are those of any other natural science, that behaviorism is securing knowledge about the organism supplementary to that gained by the other biological sciences. It does not *need* to reckon with consciousness either as datum or as result any more than does chemistry. And we must admit that behaviorism could remain at this point of view and refuse to supplement itself by the suggestions of introspective psychology. But such a refusal would involve sheer dogmatism; for all knowledge is objective and presumably harmonizable from the proper point of view.

Now the outlook at which we have arrived as the result of a suggestive epistemology enables us to deepen our knowledge of these internal processes to which behaviorism calls attention, by means of the knowledge acquired by all the other methods currently used by psychology. When we insert consciousness, which we now realize is the sole reality literally given in any investigation, into these internal processes in the way suggested, our knowledge about the organism is lit up, as it were, from within. Each individual is literally present to the extent of his consciousness in those cortical processes about which he, otherwise, has only knowledge. It is for this reason that mind alternates to-day between being a term for the brain and a term for consciousness.

But this deepening of the objective category of mind by the acknowledgment of the guiding presence of consciousness in the internal processes is continued by the modern appreciation of the genetic foundation of the consciousness and action of any one moment. Mind must be approached both phylogenetically and ontogenetically, otherwise both its conscious content of any period and its constant capacities can not be understood. What we can do now depends upon what we have done in the past; what we can think now depends upon what we have thought in the past. There is conservation and growth on both ends of the sensori-motor circuit.

In conclusion, let me apply this position to memory. We must, of course, make the elementary distinction, which I fear M. Bergson does not always make, between the fact of revival and the use made of the revival in the memory-judgment. M. Bergson contends that the brain can not account for memory. Consequently, he erects one of his tantalizing antitheses between space and time. But his contention rests in part upon his theory of perception, which is one of the weak parts of his system. The pertinent question before us is this: Can the brain so conserve the structure of its past functioning that a later functioning will contain similar conscious contents? The view of consciousness which we have been championing makes it so completely one with the functioning cortex that what we are apt to call a revival comes under the principle that what a thing can do once it can do again to the degree that it is the same. I see no reason, therefore, to postulate either an unconscious consciousness or a storehouse of ideas. But I do believe that the mind-brain which is the setting, source and condition of consciousness is a reality, complex beyond imagination. And this reality we can neither apprehend nor picture; for we can gain only knowledge about it. The metaphysical implications of this position we must postpone until another time. Suffice it to assert that consciousness does not arise within a brick-bat sort of matter as naïve materialism had to suppose. The fact that consciousness is not alien to the physical world at its highest level throws a light upon the stuff of nature from the inside. Thus the critical naturalism which follows from critical realism transcends the old materialism-spiritualism controversy. A deeper analysis brings new possibilities as its richest reward.

This suggested solution of the mind-body problem follows in my opinion from a critical epistemology; and, while more subtle than interactionism, has fewer objections to meet. Interactionism is compelled to face the question of the efficacy of consciousness in an analogous way and has, in addition, those perennial problems which face dualism. I hope that my thesis will at least be suggestive.

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